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DETAILED PERMITTING APPROACH FOR BURNING GROUNDS WITH TRANSMITTAL ABL
ROCKET CENTER WV

3/1/2001
CH2MHILL

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March 9, 2001

Chief, Office of Waste Management
West Virginia Division of Environmental Protection
1356 Hansford Street
Charleston, WV 25301-1401
Attn: Mr. James Duranti
ERPM, Hazardous Waste Permitting Unit

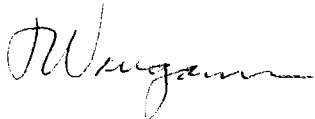
Subject: Final Detailed Permitting Approach, Burning Grounds, Allegany Ballistics
Laboratory, Rocket Center, West Virginia

Dear Mr. Duranti:

Enclosed, please find **five(5)** copies of the subject document. Additional copies of the document have been submitted to the individuals listed below. The number of copies submitted to each individual is shown in parentheses. If you would like additional copies or have any questions, please do not hesitate to contact Ms. Maritza Montegross, NAVFAC Project Manager, at 757/322-4796.

Sincerely,

ALLIANT MISSILE PRODUCTS COMPANY, LLC



John Waugaman
Environmental Manager

enclosures

cc: Ms. Lucia Pontiveros/WVDEP, Hazardous & Solid Waste Air Program (3)
Ms. Maritza Montegross/LANTDIV (5)
Mr. Louis Williams/NAVSEA (2)
Mr. David McBride/NAVSEA (1)
Mr. George Fletcher/AMPC (3)
Mr. Brett Doerr/CH2M HILL (2)

Detailed Permitting Approach

Allegany Ballistics Laboratory Rocket Center, West Virginia

FINAL

Contract Task Order 0175

March 2001

Prepared for

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Under the

LANTDIV CLEAN II Program
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Prepared by



CH2MHILL

Herndon, Virginia

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1.0 Introduction and Organization

This Detailed Permitting Approach is intended to provide an overview and serve as a guide for preparing the Resource Conservation and Recovery Act (RCRA) Part B permit application for burning (OB) and container storage at the Allegany Ballistic Laboratory (ABL or facility) in Rocket Center, West Virginia. The facility is operated by Alliant Missile Products Company (AMPC) for the United States Navy. Figure 1-1 indicates the location the Burning Grounds, also known as Site 1, where burning is conducted at ABL. The approximate boundary of the Burning Grounds is indicated by the existing fence on Figure 1-1.

Among other non-related products, AMPC manufactures solid fuel rockets and explosive warheads at the facility. Certain wastes generated in the testing and manufacturing process are "reactive" under the RCRA definition and treated by "deactivation" or burning at ABL. In addition, AMPC generates other RCRA hazardous waste stored at the facility prior to shipment off site.

There are a number of components that must be addressed, completed, and folded into the permit application. These components include, but are not limited to, the following:

- Waste Characterization
- Groundwater Monitoring Plan
- Burning Grounds Soil Investigation (Site Characterization)
- Air Pathway Modeling
- Conceptual Design of New Equipment and Appurtenances
- Risk Assessment (Human Health and Ecological)
- Closure and Contingent Closure Planning
- Financial Assurance Mechanisms

The coordination of all the stakeholders in this program is essential to combining these components into the final application and meeting the schedule. In addition, because many of the components rely on data or information from other components, all must proceed along a parallel path. This Detailed Permitting Approach is intended to clearly identify and establish schedules, events, review times, critical input points, decision points, and the responsibilities of the various stakeholders needed to meet the scheduled submittal date.

1.1 Project Planning and Organization

This Detailed Permitting Approach will serve as the primary planning document for completing the project within the allotted schedule. In order for effective planning, each stakeholder must be conscious of and abide by the tasks, timelines, and activities identified in this plan. US Naval Facilities Engineering Command - Atlantic Division (LANTDIV) and WVDEP have identified contacts at staff who will be working

on various aspects of the application. AMPC personnel will participate in all aspects of the preparation to the extent allowed by other responsibilities.

Figure 1-2 presents the CH2M HILL project organization for executing this work plan. It includes the staff of LANTDIV and WVDEP who will participate in various technical work groups.

Mr. Bob Blanz is the CH2M HILL project manager. He will report directly to Ms. Maritza Montegross, the LANTDIV Navy Technical Representative (NTR). Mr. Blanz will provide senior guidance and technical direction throughout the project's duration. Mr. Syed Mahmood and Ms. Sana Hamady will be the assistant project managers for this project, responsible for daily technical support and oversight, budget and schedule tracking, personnel resources planning and allocation, and coordination with US Naval Sea Systems Command (NAVSEA), LANTDIV, and AMPC. In addition to her role as the technical lead for permit application preparation, Ms. Nelline Scheuer will also be the senior project reviewer.

A Technical Lead has been identified, who will provide direction and guidance for each major component to the project staff in their respective areas. The project staff will review work products and ensure that the end product meets the project's data-quality objectives and is delivered within schedule and budget. The Technical Leads are:

<u>Major Component</u>	<u>Technical Lead</u>
Air Modeling	Mitch Lindsay
Groundwater Monitoring	Brett Doerr
Ecological Risk Assessment	Bill Kappleman
Human Health Risk Assessment	John Lowe
Site Investigation	Roger Azar
Permit Application Preparation	Nelline Scheuer

In addition to the CH2M HILL staff, the overall project team includes key staff of the stakeholder organizations. Because completion of many of the project tasks require timely review and input from the stakeholder organizations, it is imperative for the success of this project that all stakeholders maintain close communications. Table 1-1 indicates the technical discipline, the responsible person (work group member), and the stakeholder organizations. AMPC personnel will participate in the work groups as needed.

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— Existing Fence Line



Figure 1-1
Burning Grounds
Site Location
Detailed Permitting Approach
Allegany Ballistics Laboratory

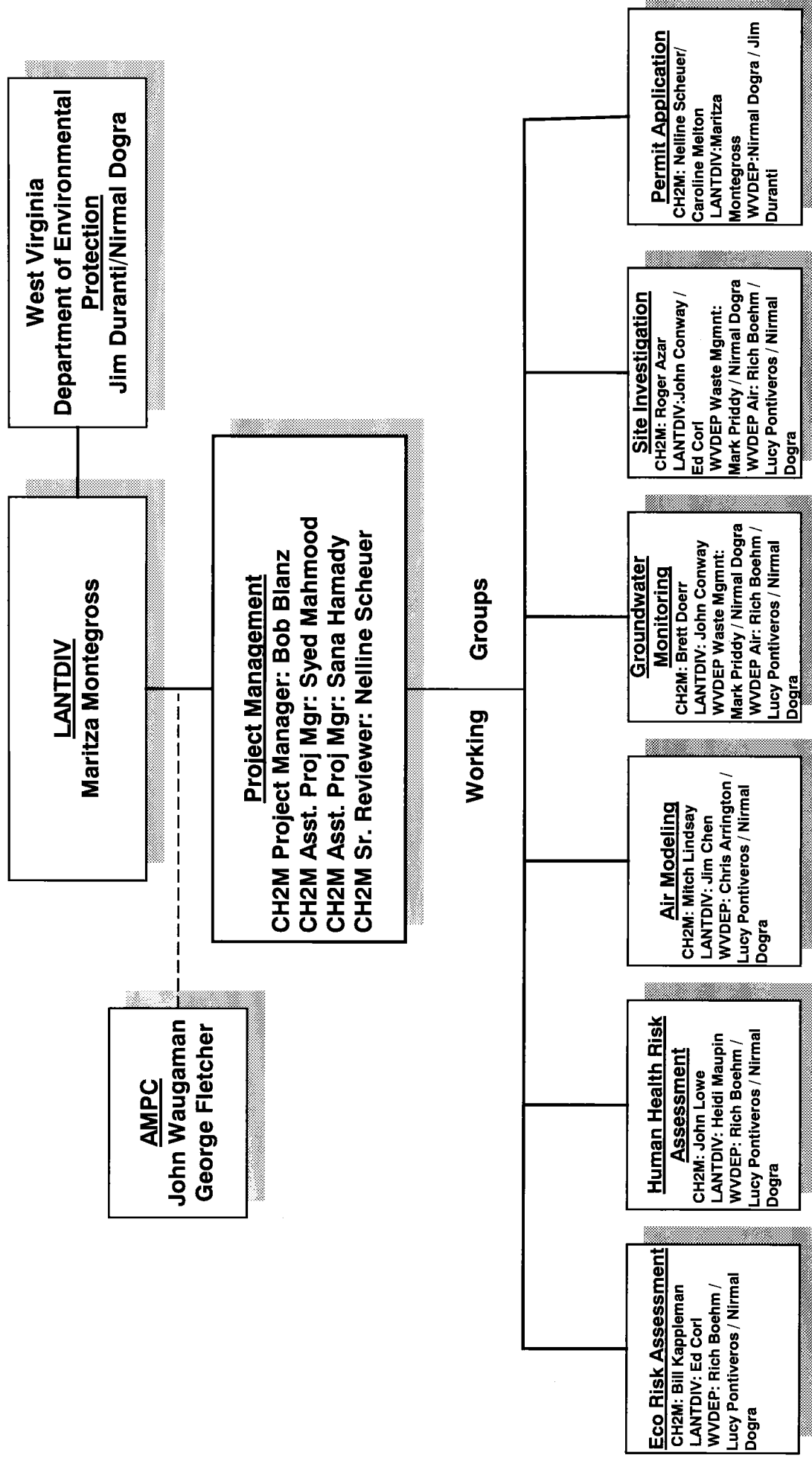


TABLE 1-1
Stakeholder Organizations and Responsible Person(s) for Major Components

Major Components	Stakeholder Organization	Responsible Person(s)
Project Management	LANTDIV	Maritza Montegross
	WVDEP	Jim Duranti / Nirmal Dogra
	AMPC	John Waugaman/George Fletcher
	CH2M HILL	Bob Blanz
	CH2M HILL	Syed Mahmood
	CH2M HILL	Sana Hamady
	CH2M HILL	Nelline Scheuer
Ecological Risk Assessment	LANTDIV	Ed Corl
	WVDEP	Rich Boehm / Lucy Pontiveros / Nirmal Dogra
	CH2M HILL	Bill Kappleman
Human Health Risk Assessment	LANTDIV	Heidi Maupin
	WVDEP	Rich Boehm / Lucy Pontiveros / Nirmal Dogra
	CH2M HILL	John Lowe
Air Modeling	LANTDIV	Jim Chen
	WVDEP	Chris Arrington / Lucy Pontiveros / Nirmal Dogra
	CH2M HILL	Mitch Lindsay
Groundwater Monitoring	LANTDIV	John Conway
	WVDEP AIR	Rich Boehm / Lucy Pontiveros / Nirmal Dogra
	WVDEP WASTE MANAGEMENT	Mark Priddy / Nirmal Dogra
	CH2M HILL	Brett Doerr
Site Investigation	LANTDIV	John Conway / Ed Corl
	WVDEP AIR	Rich Boehm / Lucy Pontiveros / Nirmal Dogra
	WVDEP WASTE MANAGEMENT	Mark Priddy / Nirmal Dogra
	CH2M HILL	Roger Azar
Permit Application Preparation	LANTDIV	Maritza Montegross
	WVDEP	Nirmal Dogra / Jim Duranti
	CH2M HILL	Nelline Scheuer
	CH2M HILL	Caroline Melton

1.2 Project Management, Coordination, and Communication

Since completion of many of the subtasks involves input/data from other tasks, close coordination and communication will be essential. The responsibility of the project managers from each of the stakeholder organizations is to plan for and execute this coordination/communication. The more formal the communications matrix, the more time consuming the information exchange. At the same time there are institutional constraints to unfettered communications between the Navy, its operating contractor (AMPC), its permitting contractor (CH2M HILL), and the State of West Virginia (WVDEP).

To partially overcome the constraints to free exchange of information and ideas among the stakeholder organizations, the concept of work groups for key application components has been established. These task work groups (participants identified in Section 1.1) are Air Modeling, Groundwater Monitoring, Ecological and Human Health Risk Assessments, Site Investigation, and Permit Application. Each is seen as a key component to the permitting process. Parallel to these tasks work groups is the assemblage of the basic application components such as waste characterization, training plans, standard operating procedures, conceptual design, closure planning, etc.

For the basic application components (or boilerplate requirements) the team will begin with the application prepared by Tetra Tech entitled *"Resource Conservation and Recovery Act Part A and B Permit Application for Allegany Ballistics Laboratory Burning Grounds and Building 366 Container Storage, EPA ID No. WV0170023691, December, 1999."* However, the team will make an effort to independently update and verify the information contained in the previous application (see Section 2.7 Permit Application for more detailed information). This will require close coordination with AMPC personnel and require time and effort to complete.

The work groups identified above will generally proceed by first providing an initial draft approach to WVDEP, meeting to present/discuss the approach, revising the approach as discussed, and resubmitting the revised approach. The process will be repeated, as necessary and within the allowable schedule, to "freeze" the approaches in the allotted time. These work products can then be used as the basis for further preparation of the application.

It will be the responsibility of each of the persons identified in Table 1-1 to coordinate within their respective stakeholder organization and notify the respective project managers of progress or the lack thereof. The project managers will then communicate and coordinate to discuss the impact on the schedule and the underlying fundamental approach (see Section 4.0 – Change Management).

The project will also include at least one and possibly two workshops of the entire project team. The first workshop was scheduled for December 13, 2000 but was completed on February 8, 2001 in Charleston, West Virginia. The express purpose of these workshops is to update all the participants on the progress to date, identify any data gaps or information needs, and confirm the path forward. A subsequent workshop is likely, in which the draft permit application will be presented and discussed. A date has not been established for this workshop. Due to the dynamic nature of this process, the projected schedule and actual milestone completion dates may not coincide. Revised schedules will be provided as necessary.

2.0 Significant Project Activities

2.1 Waste Characterization

This task encompasses the work necessary to:

- Characterize the RCRA regulated wastes to be managed at the Burning Grounds and at the Container Storage Buildings 366 and 810 under the new permit
- Provide information on the nature of the chemical constituents that might be present in the Burning Grounds soils due to historical operations

The initial work involves:

- Developing an overall understanding of RCRA waste generation at the site
- Review of RCRA waste code designations
- Review of information on combustion products of materials historically burned at the site
- Identification of information gaps if any, and preparation of a plan to fill in key information gaps

The results of this task will be documented in a Waste Characterization Technical Memorandum which will describe the RCRA hazardous waste streams to be stored or managed in the RCRA hazardous waste management units to be permitted. This information will be used in the RCRA Part B permit application.

2.2 Groundwater Monitoring

This task comprises the development of a groundwater monitoring program for the ABL Burning Grounds. The program will be developed in accordance with appropriate federal and state regulations and through coordination with appropriate WVDEP personnel. It will also be developed with consideration given to the impact/overlap of the existing groundwater extraction and treatment system in the vicinity of the Burning Grounds. The overall schedule of activities under Groundwater Monitoring is indicated in Section 3.0 Project Schedule.

2.2.1 Historical Groundwater Information

Groundwater beneath the Burning Grounds is part of a CERCLA remedial action, documented in the Record of Decision for Site 1 Groundwater (*Final Record of Decision (ROD) for Site 1 Operable Unit 3: Groundwater, Surface water, and Sediment at Allegany Ballistic Laboratory, West Virginia, dated April 1997, issued by the Office of Waste Management, State of West Virginia on May 7, 1997*). Under this remedial action, groundwater in the alluvial and bedrock aquifers at CERCLA Site 1 is hydraulically contained, thereby preventing its

discharge to the North Branch Potomac River. The contained groundwater is extracted from the aquifers, treated at an onsite facility (i.e., groundwater treatment plant) to remove VOCs, and discharged to ABL's steam generation plant and/or the North Branch Potomac River. Monitoring requirements, including discharge concentration limits, toxicity testing, and monitoring frequency, that have been established by the West Virginia Division of Environmental Protection, Office of Water Resources, are adhered to for the treatment plant effluent.

The groundwater extraction and treatment system at Site 1 (Burning Grounds) has been in operation since September 1998. A long-term monitoring program has been instituted to evaluate the effectiveness of this remedial action. As part of long-term monitoring, continuous automated and monthly manual water-level measurements are collected from a network of wells to ensure horizontal hydraulic gradients remain reversed from the river to the extraction-well alignment. To date, hydraulic monitoring data have shown the alluvial and bedrock groundwater beneath the Burning Grounds has been completely contained.

In addition to hydraulic head monitoring, the long-term monitoring plan requires the collection of groundwater samples from a network of wells on a regular basis (currently every 9 months). The samples are analyzed for primarily VOCs and the data are used to determine whether groundwater extraction results in a decrease in constituent concentrations over time. To date, four rounds of groundwater data have been collected for the CERCLA monitoring program. A baseline (i.e., pre-extraction) round was collected in June 1998. Subsequent rounds were collected in January 1999, October 1999, and July 2000.

2.2.2 Compliance Monitoring Background

Following a meeting attended by WVDEP, USEPA, Navy, AMPC, and CH2M HILL on April 15, 1999, RCRA baseline monitoring program was initiated for the groundwater at the Burning Grounds. WVDEP requested that four rounds of quarterly samples be collected from selected existing wells in and around the Burning Grounds that had been installed as part of the CERCLA program. These data were to represent the baseline groundwater conditions at the RCRA unit. It was agreed upon during the meeting that the baseline data would be evaluated and recommendations made regarding future groundwater monitoring. With concurrence of WVDEP and USEPA and under contract to AMPC, CH2M HILL collected a round of groundwater samples in April 1999 from 13 monitoring wells at and adjacent to the Burning Grounds and from the groundwater treatment plant influent and effluent. The samples were analyzed for full Appendix IX constituents, dioxins/furans, explosives, and perchlorate.

Following submittal of the first round of groundwater data to WVDEP, the Navy assumed the responsibility for the remaining three rounds of quarterly compliance sampling agreed upon with WVDEP. CH2M HILL subsequently collected three remaining quarterly rounds of groundwater samples from the same monitoring locations in April 2000, July 2000, and October 2000.

2.2.3 Evaluation of Baseline Compliance Monitoring Data

The four rounds of baseline groundwater monitoring data had been collected and validated by an independent data validator. They have been evaluated using standard statistical

methods to determine whether the constituents detected in the downgradient wells are at levels that are significantly higher than in the upgradient wells. This information was used in development of the recommended approach to future compliance monitoring, which was proposed to WVDEP in a Technical Memorandum to be issued in March 2001.

2.2.4 Evaluation of Potentially Applicable Federal and State Regulations

Federal and state groundwater regulations that are potentially applicable to RCRA compliance monitoring at the Burning Grounds have been evaluated. Those regulations deemed applicable were used in the development of the recommended approach to future compliance monitoring to be proposed to WVDEP. It is anticipated that the references indicated in Table 2-2 for groundwater regulations will be evaluated.

2.2.5 Groundwater Technical Work Group Meeting

Once the existing groundwater data and the applicable federal and/or state regulations have been evaluated, a preliminary proposal for future compliance monitoring will be developed and provided in the Technical Memorandum. A conference call with LANTDIV will be held to discuss the proposed approach. The proposed approach will consider the impact/overlap of the existing CEKCLA groundwater extraction and treatment system. With concurrence from LANTDIV, a meeting (conference call) will be arranged with WVDEP, LANTDIV, and CH2M HILL to present the proposed approach and to make any modifications deemed necessary. The ultimate goal of the meeting will be to come to concurrence on the future compliance monitoring for the RCRA unit.

2.2.6 Groundwater Compliance Monitoring Technical Memorandum

A technical memorandum has been drafted that documents the proposed long term groundwater monitoring required for the Burning Grounds under RCRA. The technical memorandum summarizes the existing data, their statistical evaluation, applicable regulations, and the methodology for conducting future long-term groundwater monitoring in accordance with the applicable regulations. This technical memorandum, once reviewed and approved by WVDEP, will constitute the accepted monitoring protocol and the relevant portions which will be incorporated into the RCRA Part B permit application.

2.3 Field Investigation

The field investigation of the Burning Grounds RCRA Unit is intended to provide information on the nature and extent of surface and shallow subsurface soil contamination at the site. The data collected from the site investigation will be used for assessing potential risks to workers on-site and to determine if any action is required at the site prior to closure.

Surface soil samples were collected to characterize the types of released materials at the site resulting from burning activities. Initial findings of the Waste Characterization task were used to determine the constituents analyzed for in order to adequately characterize the Burning Grounds. Surface and subsurface soil samples were collected from selected locations within the Burning Grounds and surface soil samples were also collected from swales and ditches directly adjacent to the Burning Grounds. Locations for all sampling

were finalized during a meeting with WVDEP and other stakeholders on February 8, 2001. The overall schedule for Site Investigation is provided in Section 3.0.

Groundwater contamination has been sufficiently characterized by the compliance monitoring program. Therefore, no additional groundwater sampling is proposed for the site investigation.

2.3.1 Field Investigation

CH2M HILL has conducted a field investigation of the existing soil conditions at the Burning Grounds to assess the potential risks to human health and the environment and to provide data for closure and post closure plans. The investigation consisted of the work plan preparation, subcontractor procurement, environmental media sampling, and waste handling.

2.3.2 Work Plan

CH2M HILL prepared a draft work plan for evaluating the existing soil conditions at the Burning Grounds. The draft work plan contains a Project Management Plan (containing project background, technical approach, and schedule), Data Collection Quality Assurance Plan (containing procedures for ensuring that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented); Data Management Plan (to track investigation data and results); a Health and Safety Plan; and an Investigation-Derived Waste Management Plan (with procedures for handling and disposal of investigation-derived waste). The Project Management Plan is designed to provide a statistically valid population of data to evaluate and characterize the surface soil and shallow subsoil. These data will be used in an evaluation of human health and ecological risks posed by the Burning Grounds. The data will also support the preparation of the closure plan section of the Part B Permit Application. These data will also be used in the conceptual design for soil handling during upgrade of each burn pan location.

After submitting the Draft Work Plan, CH2M HILL addressed the comments provided by the Navy and AMPC and produced the Draft Final Work Plan which was submitted to WVDEP. Comments provided by WVDEP on the Draft Final Work Plan were incorporated into a Final Work Plan.

2.3.3 Soil Sampling

CH2M HILL collected soil data to characterize the existing soil conditions at the Burning Grounds such that the potential human health and ecological risks can be evaluated. These data will also be used to support the closure plan, and may impact the conceptual design for soil handling during construction of the concrete pads at each burn pan location.

Soil samples were collected from locations within the Burning Grounds and an adjacent drainage ditch. Surface soil samples were collected from ground surface to a depth of approximately 0.5 feet; subsurface soil samples were collected from between 1.5 and 2 feet below ground surface. Based on recommendations from AMPC and the CH2M HILL statistician, soil sample locations were selected to be near the historic burn locations and the currently operational burn pans to demonstrate a worst case scenario (i.e., to document the likely highest constituent levels in the soil). If soil contamination is found between the 1.5 -

2.0 foot zone, deeper soil samples will be collected to determine the depth of contamination. QA/QC samples were collected during the soil sampling activities (i.e., duplicates, matrix spike/matrix spike duplicates (MS/MSDs), field blanks, equipment blanks, and trip blanks) to ensure the quality of the soil data reported.

Final locations of all samples were presented to LANTDIV, AMPC, and WVDEP during the February 8, 2001 meeting. All soil sampling locations were surveyed for horizontal control using a Global Positioning System (GPS).

Field sampling methodologies follow “Test Methods for Evaluating Solid Waste,” 3rd Edition, Sep 86 as updated, EPA/SW-846 (SW-846). All soil samples are being analyzed for selected Appendix IX parameters (SW-846), specifically excluding PCBs and pesticides; perchlorate (EPA 300.0 modified); explosives (SW-846 8330 modified); nitroglycerin (SW-846 8332); nitrocellulose (IAAP), lead, aluminum, pH and TOC. All analyses are being done on a standard 28-day turnaround time (TAT).

2.3.4 Sample Analysis, Tracking, & Data Validation

An independent data validation subcontractor will validate all Appendix IX, ammonium perchlorate, explosives, nitroglycerine, nitrocellulose, lead, and aluminum data. The pH and TOC data will not be validated. The data validation subcontractor will use EPA Region III guidance to validate analytical results on a 2-week TAT. Data that should be qualified will be flagged appropriately. Results for QA/QC samples will be reviewed and the data will be qualified further, if necessary. Finally, the data set as a whole will be examined for consistency, anomalous results, and reasonableness.

2.3.5 IDW Handling

All waste (soil and decontamination water) generated during the field investigation were drummed for offsite disposal. One composite sample of each waste medium was collected for full TCLP and reactivity, corrosivity, and ignitability (RCI) analysis.

2.4 Air Modeling

This task will be performed concurrently with the groundwater monitoring, permit preparation, and risk assessment activities. The initial activity was the development of an air emissions subgroup. The Air Emissions working subgroup is composed of staff from CH2M HILL, AMPC, LANTDIV, and WVDEP. This subgroup will review the existing data, the basis of the emissions estimates, the modeling protocol from the December 1999 application, and other applicable data, including on-site meteorological data. Establishment of the Air Modeling Protocol will be the culmination of meetings with AMPC, LANTDIV, and selected staff from WVDEP. If necessary, the protocol in the 1999 application will be revised by the interagency work group. The modeling protocol will be presented in a technical memorandum to WVDEP.

Air emission factors will be evaluated and compared against predicted emission factors from one or more combustion models. Data gaps identified from the previous air modeling effort will be resolved. Once the modeling protocol and emission factors are agreed upon, model runs will be conducted on the existing AMPC conceptual design contained in the

1999 application. Maximum Ground Level Concentrations (MGLC) will be calculated and provided for input to the Risk Assessment in Task 2.6. The ground level impact concentrations and deposition quantities will be provided to the risk assessment subgroup as soon as available.

Depending on the risk levels from these evaluations, alternate design iterations, modeling runs, and risks assessments may be required to achieve acceptable risk levels from the perspectives of human health and ecological chronic and acute inhalation, dermal exposure, and deposition. These design iterations, if necessary, will require input from AMPC on QD (quantity-distance) issues and Burning Grounds layout optimization.

The modeling protocol, air emission factors, model inputs, and model runs will be presented as an appendix in the revised permit application. The schedule for these activities is shown in Section 3.0 Project Schedule.

2.5 Preliminary Design

During the previous permit application, AMPC prepared preliminary design drawings for the burn pans, pads, and the missile units. CH2M HILL will review the existing design drawings that have been prepared by AMPC for the Burning Grounds upgrade. The conceptual design of the burn pans, pads, and the cased grain missile units was presented to WVDEP and discussed in the February 8, 2001 meeting. The soil sampling, air modeling, and risk assessment tasks will determine whether the upgrade configuration in the existing drawings is sufficient. It is anticipated that some revisions and/or addition to the conceptual design will be needed for the permit submittal. The drawing evaluation will be presented in the Basis of Design Report together with a list of deficiencies and the preliminary pan upgrade specifications.

The conceptual design will include the new pans, pads, and rocket motor fixtures. In addition, the conceptual design will include site preparation and contaminated soil management, as determined by the site investigation results and a level-of-effort cost estimate. After the issuance of the permit, a detailed design and bid documents should be prepared and submitted in accordance with the permit stipulations. It should be noted that a detailed design is not in the current scope of work of CH2M HILL.

CH2M HILL will prepare an order-of-magnitude (-30% to +50%) cost estimate for the Burning Grounds upgrade. It is assumed that the estimate is to be used as an approximation of the upgrade cost only. Therefore, no cost estimates from construction contractors will be solicited. Cost estimates will be made from unit prices available in CH2M HILL's construction estimating database and other published estimating guides. The overall schedule for preliminary design is presented in Section 3.0 Project Schedule.

2.6 Risk Assessment

This section outlines the basic approach for conducting the human health and ecological risk assessments. The human health and ecological risk assessments will support the following information requirements for permitting the burning units:

- Protection of Groundwater and Subsurface Environment
 - Potential impacts to human health - 40CFR264.601(a)(8) and (b)(10)
 - Potential for damage to flora and fauna - 40CFR264.601(a)(9) and (b)(11)
- Air Quality Assessments
 - Risk Analysis - 40CFR264.601(c)(6)
- Potential Damage to Domestic Animals, Wildlife, Crops and Vegetation - 40CFR264.601(c)(7)
- Identification of Potential Human and Environmental Receptors - 40CFR270.23(c)
- Identification of Potential Exposure Pathways, Magnitude and Nature of Exposure - 40CFR270.23(c)

The human health and ecological risk assessments will: (1) quantify risks due to current conditions within the RCRA unit, based primarily on the results (analytical data) of the site investigation described in Section 2.3, and (2) will quantify potential future risks posed by ongoing operations based on the new facility design (Section 2.5) and the air quality modeling results described in Section 2.4. The evaluation of current and future risks will be documented in separate sections of each risk assessment report.

The evaluation of current risks will rely primarily on analytical data (soils) collected within the RCRA unit although the potential for off-site transport via groundwater and surface runoff will also be evaluated. The object of this portion of the risk assessment is to evaluate any current risks within the unit to determine if any actions are required to address these risks prior to construction of the new burn pans and pads, and to support any required closure plan for the unit.

The evaluation of potential future risks from continued operations will rely primarily on modeled exposure estimates (i.e., concentrations in relevant media as determined from the air and deposition modeling) based on the new facility design. The spatial extent of this evaluation will depend upon the results of the dispersion modeling but is expected to encompass areas both within and outside of the unit. The objective of this portion of the risk assessment is to evaluate any potential risks to human and ecological receptors from ongoing facility operations so that measures can be taken to reduce any identified risks to acceptable levels through modifications to the design or other appropriate mechanisms.

This section identifies the plan for preparing the risk assessments, describes the formation and proposed activities of the Risk Assessment Working Group, and presents the proposed schedule for completing the risk assessments. Linkages with other tasks, including waste characterization, groundwater monitoring program, site investigation, and air dispersion modeling, are also identified in this section.

2.6.1 Work Planning

The ecological and human health risk assessments will be conducted using a step-wise approach to allow for Navy, AMPC, and regulator input throughout the process. This process will include the preparation of several interim documents (e.g., technical

memoranda, risk assessment protocols) for use in discussing approaches to the risk assessments as well as a series of meetings and conference calls. In addition, the risk assessment will be closely coordinated with the other components of the permit process (e.g., air modeling). The following subsections address the human health and ecological risk assessments.

2.6.2 Human Health Risk Assessment (HHRA)

The HHRA will use data developed from the groundwater monitoring program (Section 2.2), the site investigation (Section 2.3), and the air modeling (Section 2.4) to evaluate the potential current and future risks to human health associated with the Burning Grounds. The HHRA will be conducted in accordance with applicable human health risk assessment guidance for direct and indirect exposure pathways. The assessment of potential human health risks from direct exposure pathways will follow USEPA's Risk Assessment Guidance for Superfund (RAGS) (USEPA 1989, 1996, 1999a). In addition, the assessment of potential human health risks from indirect exposure pathways may be conducted if deemed necessary. If implemented, appropriate guidance will be consulted for conducting an indirect pathways risk assessment. The HHRA will evaluate the current and potential effects of burning-related chemical constituents in relevant media (e.g., air, groundwater, surface water, sediment, and surface soil) as determined from existing and proposed sampling data, and air dispersion and depositional modeling. The characterization of risks to human health will involve identifying the potential exposures of human receptors and evaluating the potential effects associated with such exposures. The HHRA will include the following activities:

1. **Development of the Conceptual Model of Human Exposure Pathways** - The conceptual model will outline complete transport pathways, exposure media, exposure routes, and receptors. The Human Exposure conceptual model will be developed to account for current on-site workers (direct exposure pathways) and off-site receptors (indirect exposure pathways).
2. **Identification of Chemicals of Potential Concern (COPCs)** - COPCs are those chemicals that potentially present the greatest human health concerns (i.e., those present at the highest concentrations, have widespread distribution at the site, have the highest mobility or the highest toxicity). The purpose of identifying COPCs is to focus the risk assessment on the most important chemicals at the site. USEPA Region 3 guidance (USEPA 1999a) will be used for identifying COPCs. In a few cases, there may be chemicals without available toxicity values or USEPA Region 3 screening levels (used for identifying COPCs). Chemicals without existing toxicity values or USEPA Region 3 risk-based concentrations will be evaluated qualitatively to determine if they should be retained as COPCs. Factors considered in evaluating these chemicals will include quantities emitted or released and qualitative toxicity information as obtained from a brief review of National Library of Medicine TOXLINE databases.
3. **Exposure Assessment** - The exposure assessment will be based on scenarios that define human populations potentially exposed to COPCs at the site. Information describing the local setting around the Burning Grounds, developed during the a review of existing information, will be used to define these exposure scenarios. The potential pathways of exposure, frequency, and duration of potential exposures, and exposure factors for

contact with environmental media will be based on values presented in USEPA guidance. The concentrations of COPCs in environmental media used to estimate potential exposures will be based on data from: (1) the air dispersion and deposition modeling (Section 2.4); (2) soil sampling (Section 2.3); (3) previous site assessments; and (4) the groundwater monitoring program (Section 2.2). Exposure pathways potentially associated with emissions to the air from the Burning Grounds will be addressed in a tiered manner. Tier 1 will conservatively evaluate risks for a hypothetical off-site maximum-exposure individual. After this initial evaluation, a Tier 2 evaluation may be performed that will be based on potential exposures at locations more likely to be occupied by human receptors. If the assessment of indirect pathways is deemed necessary, appropriate guidance will be consulted to estimate concentrations in environmental media (i.e., soil, water, or biota).

4. **Toxicity Assessment** - The toxicity assessment evaluates the relationship between the magnitude of exposure to a chemical and the adverse health effects. This assessment provides, where possible, a numerical estimate of the increased likelihood and/or severity of adverse effects associated with chemical exposure (USEPA 1989). Toxicity values will be obtained from USEPA sources, including the National Center for Environmental Assessment (source for the Integrated Risk Information System or IRIS database) and the Office of Solid Waste and Emergency Response (source for the Health Effects Assessment Summary Tables). Brief toxicity profiles will be drafted for selected COPCs as needed to characterize human health risks.
5. **Risk Characterization** - Risk characterization combines the results of the toxicity and exposure assessments to provide numerical estimates of potential health effects. The risk characterization will also qualitatively evaluate the nature of, and weight of, evidence supporting these numerical estimates, and will describe the uncertainties surrounding such estimates.

2.6.3 Ecological Risk Assessment (ERA)

The ERA will be conducted in accordance with applicable ecological risk assessment guidance for screening risk assessments (e.g., USEPA 1997, 1998b, 1999b) as modified by current Navy policy (e.g., CNO 1999) and any future Navy ERA guidance (if available at the time the draft ERA is prepared). The ERA will evaluate the current and potential ecological effects of burning-related chemical constituents in ecologically relevant media (e.g., air, surface water, sediment, and surface soil) as determined from existing and proposed sampling data as well as from air dispersion and depositional modeling. The characterization of ecological risks will involve identifying the potential exposures of ecological receptors and evaluating the potential effects associated with such exposures. The ERA will include the following activities:

1. **Estimation of Chemical Concentrations in Applicable Media** - Data from the air dispersion and deposition modeling (Section 2.4); soil sampling (Section 2.3); previous site assessments; and the groundwater monitoring program (Section 2.2) will be used to estimate ecological exposures for baseline (existing) conditions and for future conditions associated with Burning Grounds operations (assuming a 30-year active life). Standard models from the literature will be used to estimate concentrations of COPCs in air,

surface soil, surface water, sediment, and biological tissues (for food web exposure modeling). Modeling will be coordinated with the HHRA.

2. **Problem Formulation** - Problem formulation involves: (1) compiling and reviewing existing information on the habitats and biota potentially present on the site and in the site vicinity; (2) developing a conceptual model that includes an evaluation of transport pathways, fate and transport mechanisms, exposure media, exposure routes, mechanisms of toxicity, and potential receptors; (3) developing exposure scenarios; and (4) developing assessment and measurement endpoints for all complete exposure pathways.

A 1-day reconnaissance-level ecological site visit was performed for the site and surrounding areas. During the site visit, information was collected on the following:

- Topographic features and general land use
- Surface water bodies and wetlands
- Habitat types and principal plant species
- Sensitive habitats
- Wildlife species observed.

The results of the site visit were used to characterize the ecological features of the site and surrounding areas. The data collected was collected based solely by observational methods; no biological samples (e.g., bioassay or toxicity studies) or quantitative population/community data are included. The results from any previous ecological field surveys and existing documents, maps, and aerial photographs describing natural resources at the facility (as determined from a review of existing information) were used to focus, and supplement the results of, the site survey.

3. **Analysis** - This portion of the ERA includes exposure assessment and toxicity assessment. As part of the exposure and toxicity assessments, all analytical data (current conditions) and modeled estimates (ongoing operations) will be compared, on a medium-specific basis, to applicable ecological screening values to develop a list of COPCs. A food web model will be used for receptors selected as part of problem formulation to evaluate the potential risk for all bioaccumulating COPCs. Exposure calculations will be conducted for both a reasonable maximum exposure scenario and, as needed, more realistic exposure scenarios.
4. **Risk Characterization** - This portion of the ERA uses the information generated during the preceding steps to estimate potential risks to ecological receptors for the exposure scenarios evaluated. Also included is an evaluation of the uncertainties associated with the models, assumptions, and methods used in the ERA, and their potential effects on the conclusions of the assessment.

2.6.4 Risk Assessment Deliverables

The HHRA and ERA will be prepared as stand-alone attachments to the permit application, with the relevant results summarized and included in the applicable sections of the permit application. A minimum of two versions of the HHRA and ERA will be prepared. Prior to preparing the draft risk assessment reports, several interim documents will also be prepared as follows:

- For the ERA, a technical memorandum that describes the results of the initial problem formulation, including the preliminary conceptual model, will be developed. Similarly, for the HHRA, a technical memorandum will be prepared presenting the initial conceptual model of human exposure pathways. The draft memoranda will be discussed during a risk assessment technical meeting (see Section 2.6.5). These technical memoranda which will be used as the starting point for developing a risk assessment protocol for the ERA and HHRA, were submitted in draft form to WVDEP on 5 December 2000.
- The risk assessment protocols will outline the specific methodologies, guidance, assumptions, equations, parameter values, and exposure scenarios that will be used in the risk assessment. These protocols will be developed from the technical memoranda and the discussions at the risk assessment technical meetings and conference calls. The protocols will document the agreements reached on the approach, methods, COPCs, receptors, exposure pathways, and exposure scenarios for the risk assessment and will be used to guide the completion of the draft ERA and HHRA reports.

The following assumptions have been made relative to the scope of the HHRA and ERA:

- No site-specific ecological studies (e.g., toxicity tests) will be conducted as part of the ERA
- The abiotic media that will be addressed are limited to air, surface water, sediment, surface soil, subsurface soil, and groundwater
- One version of the technical memo and two versions of the HHRA report will be prepared
- A minimum of One will be prepared
- The risk assessment protocols will be working documents and thus will not be issued as a formal deliverable until finalized by the risk assessment work group.

2.6.5 Risk Assessment Work Group

The purpose of the risk assessment work group is to address risk-assessment-specific issues related to the permit application. The core work group is composed of: (1) the LANTDIV lead ecological and human health assessors; (2) the risk assessment representative from WVDEP, (3) the lead ecological and human health risk assessors from CH2M HILL, and (4) representatives from the facility / AMPC, as appropriate. Other personnel may participate in specific calls or meetings (e.g., links from other work groups, such as the one developing the air modeling protocol) on an as needed basis.

Two to four technical meetings and a series of conference calls are planned. The human health and ecological risk assessments will be jointly discussed at the work group meetings but some of the calls may be limited to a subset of the work group to discuss ERA or HHRA-specific questions that do not impact the other assessment.

2.6.6 Risk Assessment Schedule

The proposed schedule of risk assessment activities is shown in Section 3.0 Project Schedule and summarized on Figure 3-1.

2.6.7 Risk Assessment References

Following is a listing of selected risk assessment references that will be used in the performance of this task:

- Chief of Naval Operations (CNO). 1999. *Navy policy for conducting ecological risk assessments*. Memorandum from Chief of Naval Operations to Commander, Naval Facilities Engineering Command. Ser N453E/9U595355. April 5, 1999.
- US Environmental Protection Agency (USEPA). 1999a. *Selecting exposure routes and contaminants of concern by risk-based screening*. USEPA Region III Technical Guidance Manual for Risk Assessment. <http://www.epa.gov/reg3hwmd/risk/guide2.htm>
- U.S. Environmental Protection Agency (USEPA). 1999b. *Screening level ecological risk assessment protocol for hazardous waste combustion facilities*. EPA/530/D-99/001A. Peer Review Draft. August.
- U.S. Environmental Protection Agency (USEPA). 1998a. *Human health risk assessment protocol for hazardous waste combustion facilities*. EPA/530-D-98-001.
- U.S. Environmental Protection Agency (USEPA). 1998b. *Guidelines for ecological risk assessment*. EPA/630/R-95/002F.
- U.S. Environmental Protection Agency (USEPA). 1997. *Ecological risk assessment guidance for Superfund: process for designing and conducting ecological risk assessments*. Interim Final. EPA/540/R-97/006.
- U.S. Environmental Protection Agency (USEPA). 1996. *Superfund soil screening guidance: user's guide, second edition*. Office of Solid Waste and Emergency Response, Publication 9355.4-35. Washington, DC.
- U.S. Environmental Protection Agency (USEPA). 1989. *Risk assessment guidance for Superfund. Human health evaluation manual Part A, Final*. Office of Solid Waste and Emergency Response. Publication 9285.701.A. Washington, DC.

2.7 Permit Application

The Part B permit application for the OB unit, the existing container storage unit (renewal), and proposed labpack container storage unit will be prepared to meet the relevant requirements of 40 CFR 264, *Standards For Owners And Operators of Hazardous Waste Treatment, Storage and Disposal Facilities* and 40 CFR 270 *EPA Administered Permit Programs: The Hazardous Waste Permit Program*. The application will be prepared using existing documentation where possible. The results of other tasks in the project will be integrated into the Part B permit application. The permit application will follow the EPA checklist, provided by WVDEP in July 2000. In addition, the permit application will be revised to

address Notices of Deficiency issued by WVDEP on June 30, 2000. Selected information required for the Part B permit application is described in this section.

2.7.1 Document Review

Preparation of the Part B application will begin with a review of the existing Part B application and other available information for the OB unit, existing container storage unit, and proposed container storage (labpack) unit. The EPA Part B permitting checklist will be used to check for completeness and identify any additional needed information. The adequacy of each section will be determined and a preliminary information needs list will be prepared. The list will be provided to AMPC and a site visit scheduled.

2.7.2 Collection of Additional Information and Interviews

A site visit was conducted early December to discuss the preliminary information needs, identify remaining data gaps, and interview site staff for any needed information not found in documentation (e.g., labpack unit operating procedures). As anticipated, additional information may be required as further work on the permit application progresses. Close coordination with the AMPC staff will be required to obtain the needed information, establish procedures, and prepare a complete permit application.

2.7.3 Preparation of Permit Application

Using information collected from site files, AMPC, the existing Part B permit application, and the output of other tasks in this project, the draft Part B permit application will be prepared and submitted for review by LANTDIV. Comments will be incorporated and a final draft submitted to LANTDIV and AMPC. Detailed milestones are outlined in Section 3.0 Project Schedule.

Following is a general description of the requirements for the Part B permit application for reference in understanding the types of information that may be needed from AMPC for the new container storage labpack unit, as well as updates for the burning and existing container storage unit. This list is generic and does not reflect review of documents already received from ABL. It is provided to show the types of information that will be checked for in the document review and facility visit.

TABLE 2-2

Requirements for the Part B Permit Application

Permit Application Section	Section Details	Citation¹
Part A Application	Hazardous wastes treated or managed in each unit to be permitted.	40 CFR 270.10, 11 and 13 (WV Code 33-20-11)
Facility Description	Facility description	
	Topographical map showing facility, facility boundaries, groundwater information	40 CFR 270.14, 264.95 and 264.97 (WV Code 33-20-11 and 33-20-7)
	Political jurisdiction, location of faults, location of 100 yr. flood plain	40 CFR 264.18, Part 264 Appendix VI (WV Code 33-20-7)
	On-site traffic information including load bearing capabilities of on-site roads	40 CFR 270.14 (WV Code 33-20-11)
Process Information	Container descriptions, management practices, containment system design	40 CFR 270.15, 264.170 through 264.178 (WV Code 33-20-11 and 33-20-7)
	Process information concerning the burn pads including but not limited to description of process, characterization of wastes treated, amounts of wastes treated.	40CFR264.601, 270.23 (WV Code 33-20-11 and 33-20-7)
	For groundwater, subsurface environment, surface water, wetlands, soil surface and air performance standards which to protect human health and the environment must be established. These standards are based on the risk assessment results, waste managed, types and quantities of emissions or releases, and extent of migration or dispersion of the waste in various media.	
Groundwater Monitoring	Interim status (previous) groundwater data, description of wells, description of sampling/analysis procedures, statistical procedures, groundwater assessment plan; hydrogeological information; topographic map; contaminant plume description; monitoring program requirements, indicator parameters, waste constituents, reaction products, background concentrations, compliance point monitoring wells, concentration limits, alternate concentration limits	40 CFR 270.14, 265.90 - 265.100 (WV Code 33-20-11 and 33-20-8)
Procedures To Prevent Hazards	Description of the facility security system including surveillance systems. Facility inspection procedures and schedules. Description of facilities and procedures for segregation and storage of wastes.	40 CFR 264.14, and 15, 270.14 (WV Code 33-20-11 and 33-20-7)

TABLE 2-2
Requirements for the Part B Permit Application

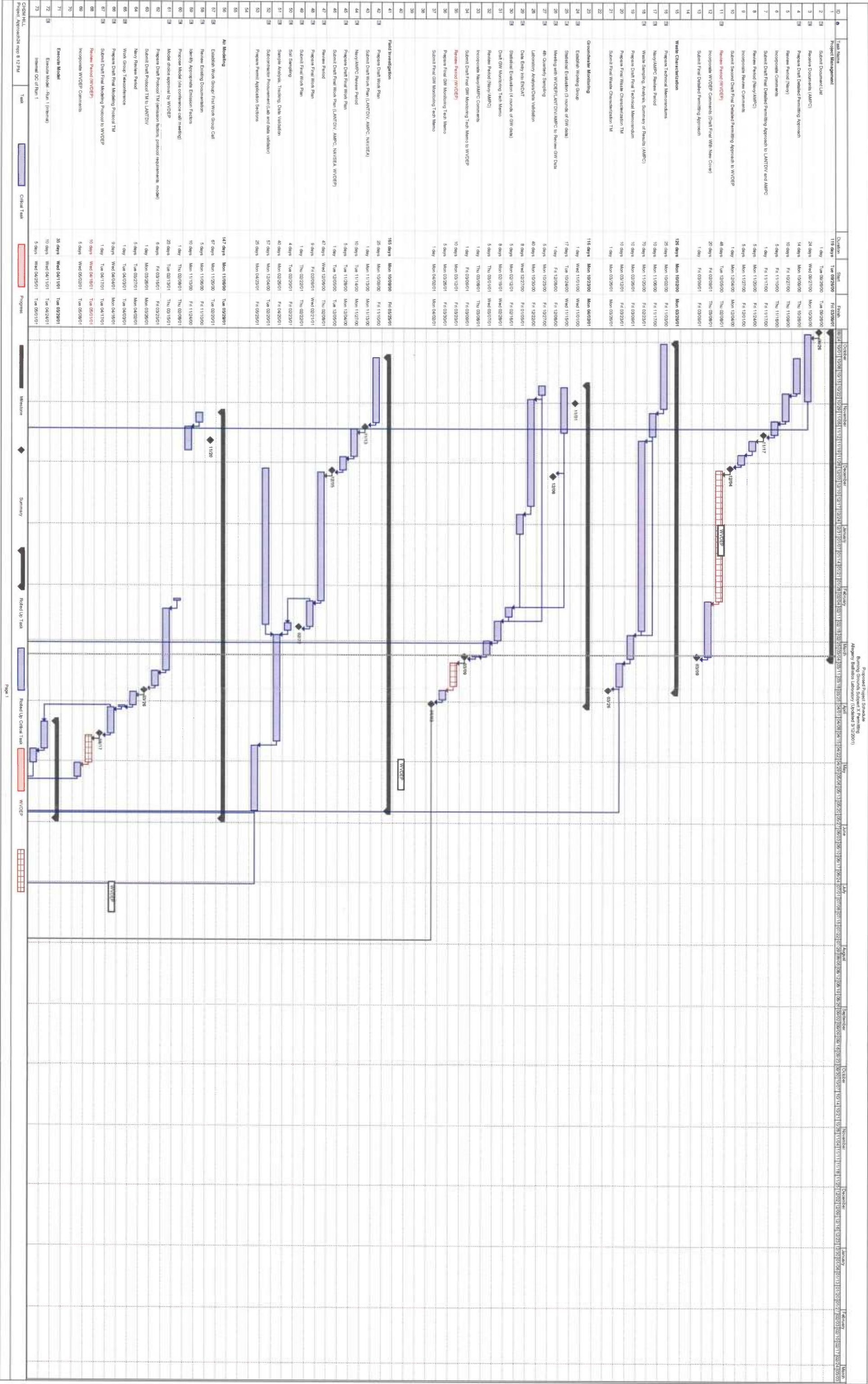
Permit Application Section	Section Details	Citation ¹
Contingency Plan	Emergency coordinators, implementation, emergency actions, emergency equipment, coordination agreements, evacuation plan, required reports	40 CFR 270.14, 264.50 through 264.56 (WV Code 33-20-11 and 33-20-7)
Personnel Training	Detailed description of the facility training program. Documentation that facility personnel have completed required training	40 CFR 270.14, 264.16 (WV Code 33-20-11 and 33-20-7)
Closure Plans, Post-Closure Plans, And Financial Requirements	Closure Plan, Post-Closure/ Contingency Post-Closure, Closure Cost Estimate and Financial Assurance Mechanisms	40 CFR 270.14, 264.110 through 264.151, 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, and 264.351 (WV Code 33-20-11 and 33-20-7)
Corrective Action for Solid Waste Management Units	Identify of all solid waste management units (SWMU's), descriptions of each unit including historical use, any release information.	40 CFR 270.14, 264.101 (WV Code 33-20-11 and 33-20-7)
Other Federal Laws		40 CFR 270.14, 270.3 (WV Code 33-20-11)
Part B Certification		40 CFR 270.11 (WV Code 33-20-11)

¹ CFR: Code of Federal Register. WV Code: West Virginia Code, West Virginia Hazardous Waste Management Act

As mentioned earlier, close coordination with AMPC will be needed to collect the information and understanding needed to accurately reflect facility operations and prepare a permit application that gives AMPC and the Navy latitude for effective and environmentally protective operation of the RCRA units.

3.0 Project Schedule

The overall project schedule for the permitting approach is provided in Figure 3-1. It illustrates the schedule of and the relationship between the various activities outlined in this Detailed Project Approach. These activities are closely tied to the overall schedule and must be adhered to if the submittal date is to be met. The individual tasks and subtasks contain submittal schedules, review schedules, and meeting schedules. All stakeholders are encouraged to note these schedules and estimate the effort and time to complete the necessary activities identified in each. It is assumed the review time required by regulators will be within the time budgeted in the schedule. Table 3-1 presents a summary of the critical milestones selected from the schedule that pertain to WVDEP .



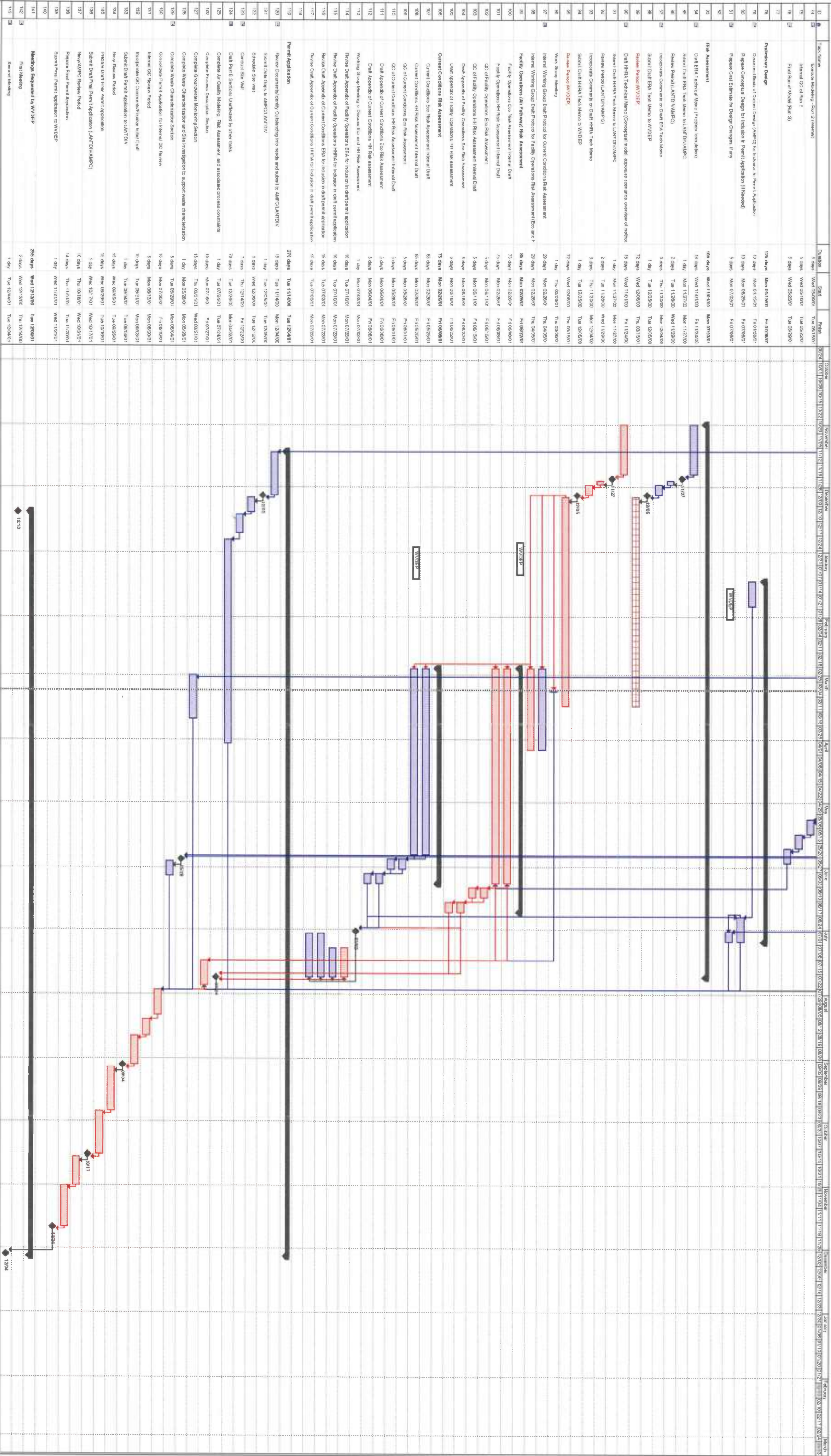


TABLE 3-1
Summary of Critical Milestones

Item No.	Critical Milestones	Scheduled Date
1	Permitting Approach	
	Submit Draft Final Permitting Approach to WVDEP	December 4, 2000
	Receive WVDEP Review Comments	February 8, 2001
	Submit Final Detailed Permitting Approach	March 9, 2001
2	Field Investigation Work Plan	
	Submit Draft Final Field Investigation Work Plan to WVDEP	December 5, 2000
	Receive WVDEP Review Comments	February 8, 2001
	Submit Final Field Investigation Work Plan	February 22, 2001
3	Groundwater Tech Memo	
	Submit Draft Final Groundwater Tech Memo to WVDEP	March 9, 2001
	Receive WVDEP Comments	March 23, 2001
	Submit Final Groundwater Tech Memo	April 2, 2001
4	Air Tech Memo	
	Submit Draft Final Air Tech Memo to WVDEP	April 17, 2001
	Receive WVDEP Comments	May 1, 2001
5	Risk Assessments Tech Memo	
	Submit Draft Ecological and Human Health Risk Assessment Tech Memos to WVDEP	December 5, 2000
	Receive WVDEP Comments	February 8, 2001
	Draft Current Conditions Risk Assessment (Preview Draft)	June 8, 2001
	Draft Facility Operations Risk Assessment (Preview Draft)	June 22, 2001
	Informal Feedback from WVDEP	July 2, 2001
6	Meetings with WVDEP	
	First Work Group Meeting	February 8, 2001
	Second Work Group Meeting	September 17, 2001
7	Permit Application	
	Submit Final Permit Application to WVDEP	December 4, 2001

4.0 Change Management

This project involves integrating a parallel, tiered array of tasks and subtasks into a permit application for submission to WVDEP. There are at least 20 people from various stakeholder organizations that must have some "hands-on time" with many of the various components. In addition, many of the components are interrelated such that a change in one may affect several of the other tasks. Therefore, it is unlikely that the sequence of events and schedule will always progress as planned. In order to be successful, we must plan for changes in the work plan, the schedule, and the sequencing of tasks.

Managing for change naturally involves the project managers from each of the stakeholder organizations. Project managers from LANTDIV, WVDEP, and CH2M HILL will be the primary contacts but other organizations such as AMPC, NAVSEA, and EPA may also have a role. Table 4-1 provides a matrix of contacts needed to manage anticipated changes.

TABLE 4-1
Change Contact Matrix

Change Category	LANTDIV	WVDEP	CH2M HILL	AMPC	NAVSEA	EPA
Schedule	X	X	X		X	X
Scope	X	X	X	X	X	
Costs	X		X		X	
Personnel	X	X	X	X	X	X

In order to avoid wasted time and resources, it is essential that issues, which could potentially affect the project planning (i.e., scope, schedule), be identified as soon as possible. **This is the responsibility of everyone involved in the project.**

If events/issues/circumstances cannot be solved at the task or work group level, they should be identified for the respective organizational PM(s). It would be helpful if the circumstances and implications can be explained in sufficient detail to allow the respective PM(s) to clarify/determine/understand the ramifications of the issue. This will facilitate discussions and decisions with a minimum of lost time.

Once the issue has been defined and the organizational PMs are able to discuss and agree on what changes are necessary in the scope, budget, and schedule a revised Work Plan will be prepared.

Work plan revisions that do not impact costs, will be prepared as addenda if at all possible. Work Plan revisions that involve changes in the project scope and costs will require at least three weeks to revise the Task Order and issue a modification. Schedule revisions, including changes that do not affect the application submittal date, will be addressed with the publication of a new schedule.